

Investigation of the Turbulent Cavitating Flows from the Viewpoint of the Lift Coefficient

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Abstract : The objective of this study is to investigate the relationship between the lift coefficient and dynamic behaviors of cavitating flow around a two-dimensional Clark Y hydrofoil at 8° angle of attack, cavitation number of 0.8, and Reynolds number of 7.10^5 . The flow field is investigated numerically by using a vapor transfer equation and a modified turbulence model which applies the filter and local density correction. The results including time-averaged lift/drag coefficient and shedding frequency agree well with experimental observations, which confirmed the reliability of this simulation. According to the variation of lift coefficient, the cycle which consists of growth and shedding of cavitation can be divided into three stages, and the lift coefficient at each stage behaves similarly due to the formation and shedding of the cavity around the trailing edge.

Keywords : Computational Fluid Dynamics, cavitation, turbulence, lift coefficient

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